

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An apparatus comprising first and second substrates, each of the substrates having a surface containing ~~a plurality of~~ at least about 1000 open, nanoscale channels disposed therein, the surfaces bonded together such that each of the channels of the first substrate is in fluid communication with at least two of the channels of the second substrate and is misaligned relative to the channels of the second substrate; and wherein the fluid communication between channels creates a continuous nonlinear pathway for a fluid to flow alternatingly between the channels of the first substrate and the channels of the second substrate.
2. (Currently Amended) The apparatus of claim 1, wherein the channels have equivalent and constant cross-sectional ~~diameters~~ areas within a range of about 1 square nanometers (nm^2) to about 10,000 nm^2 .
3. (Currently Amended) The apparatus of claim 1, wherein the channels have equivalent and variable cross-sectional ~~diameters~~ areas within a range of about 1 nm^2 to about 10,000 nm^2 .
4. (Original) The apparatus of claim 1, wherein each of said surfaces has at least about 1000 channels to about ten million channels disposed therein.
5. (Original) The apparatus of claim 1, wherein each of the channels traverses an entire length of the surface.
6. (Original) The apparatus of claim 1, wherein the channels of the first substrate are parallel to each other, and the channels of the second substrate are parallel to each other.
7. (Original) The apparatus of claim 1, wherein the channels of the first substrate are spaced equidistant from each other, and the channels of the second substrate are spaced equidistant from each other.

8. (Original) The apparatus of claim 1, wherein the first and second substrates comprise one or more materials selected from the group consisting of quartz, silica, silicon, porous silicon, polysilicon, and porous polysilicon.

9. (Original) The apparatus of claim 8, wherein the first and second substrates comprise quartz.

10. (Original) The apparatus of claim 1, further comprising third and fourth substrates bonded to edge surfaces of each of the first and second substrates, the edge surfaces being substantially perpendicular to the channels.

11. (Original) The apparatus of claim 10, wherein the third and fourth substrates comprise one or more materials selected from the group consisting of quartz, silica, silicon, porous silicon, polysilicon, porous polysilicon, and silicon oxynitride.

12. (Original) The apparatus of claim 11, wherein the third and fourth substrates comprise silicon oxynitride.

13. (Original) The apparatus of claim 1, wherein the channels of the first substrate are misaligned relative to the channels of the second substrate by an angle of about 0.05° to about 45° , the angle defined by an intersection of a channel of the first substrate and a channel of the second substrate.

Claims 14-31 (Canceled).

32. (New) The apparatus of claim 1 also including electrodes disposed such that the electrodes are capable of creating an electric field along a length of the path traveled by a liquid flowing through the continuous nonlinear pathway.